Generating In-process Stock and Checking Validity

I-DEAS® Tutorials: Milling Projects and Turning Projects

In this tutorial, you'll learn how to generate in-process stock. In-process stock is a representation of the stock after the tool cuts away material for each operation. Your stock appears on the workbench as if it were "in the process" of being machined.

You'll also modify the setup assembly and update the toolpath to the changes.
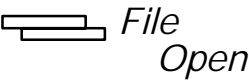
Learn how to:

- generate in-process stock
- modify a setup assembly
- check validity

Before you begin...

Prerequisite tutorials:

- all tutorials under the Modeling Fundamentals menu
- Introduction to Generative Machining
- Building a Setup Assembly

Retrieve the model file that you created in the Building a Setup Assembly tutorial.

File
    Open

Model File Name: ncsetup
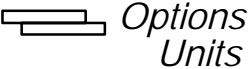
OK

Make sure you're in the following application and task:

Application: Manufacturing

Task: Generative Machining

Set your units to inches.

Options
    Units

Inch (pound f)

Recovery Point

⊟ *File*
     Save

Warning!

If you're prompted by I-DEAS to save your model file, respond:

▭ *No*

Save only when the tutorial instructions tell you to—not when I-DEAS prompts for a save.

If you make a mistake at any time between saves and can't recover, you can reopen your model file to the last save and start over from that point.

Hint
To reopen your model file to the previous save, press Control-Z.

In the next steps, you'll turn on in-process stock calculations and create a volume clear operation. After you process the toolpath, you'll notice that the stock instance reflects the cutting passes. In particular, the tool avoids the clamp that overlaps the pocket and leaves material under it.
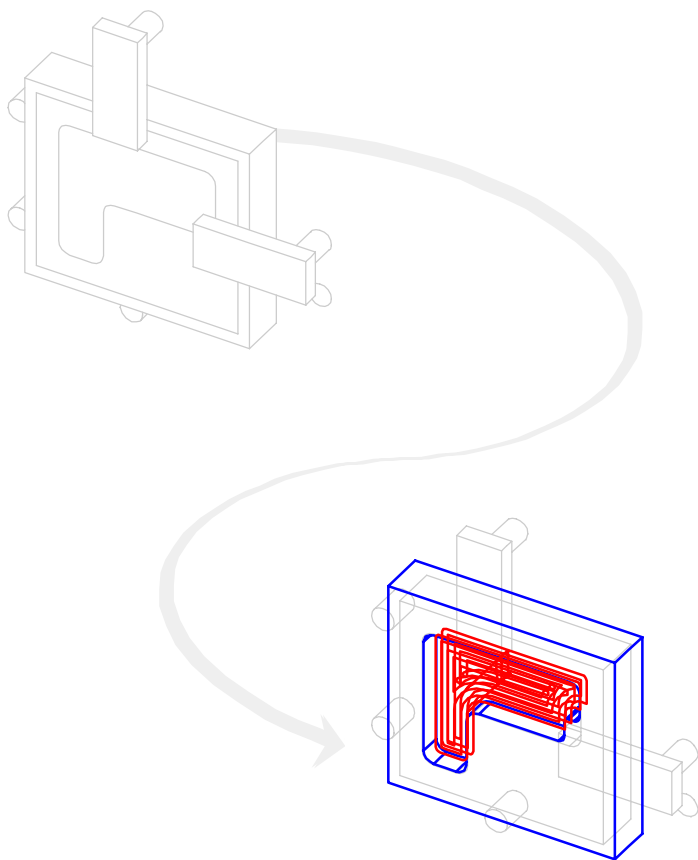
What: Enable in-process stock calculations for the setup.

How:
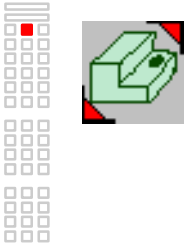
NC Job Planning form

 Setup–1

Setup Specification form

 Enable In-Process Stock Calculations—On

 Dismiss

Don't close the NC Job Planning form.

What: Modify the opgroup and create a volume clear operation.

How:

NC Job Planning form

 OpGroup-1

OpGroup Specification form

Operation Selection form

 Category: Milling

 Type: Volume Clear

 Create

 Don't close the Operation Specification form.

What: Name the operation, then pick the surfaces composing the pocket.
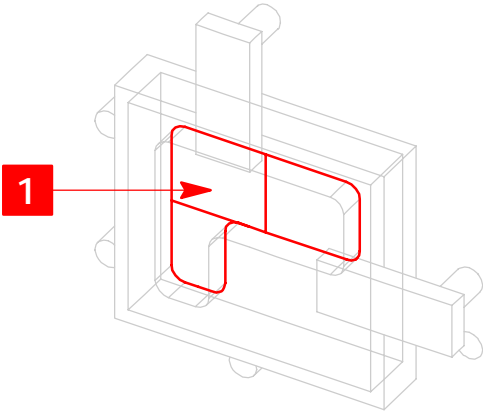
How:

Operation Specification form

Name: Clear Pocket

double–click on the surface to select the pocket

Things to notice
All surfaces related to the bottom surface you selected are highlighted.

Stock Specification form

OK

Don't close the Operation Specification form.

What: Create a .25 inch end mill.

How:

Operation Specification form

Cutting Tool Specification – Mill form

     Identifier: .25 Endmill

Press the Tab key to move to the next field.

I–DEAS Warning form

     OK

     Style: End Mill

     Holder To Tip Dist: 2.5

     Max Depth of Cut: 1.5

     Cutter Diameter: .25

     Nose Radius: 0

     OK

 Don't close the Operation Specification form.

What: Define the step between each cutting pass as 60 percent of the tool diameter.

How:

Operation Specification form

Machining Parameters form

◆ *Stepover Distance* (on)*: 60*

Things to notice
You'll accept the default cut pattern of *Spiral Out* and the cut type of *Climb*. You use *Spiral Out* so the tool will start the cuts inside the pocket and make the last pass along the walls.

▭ *OK*

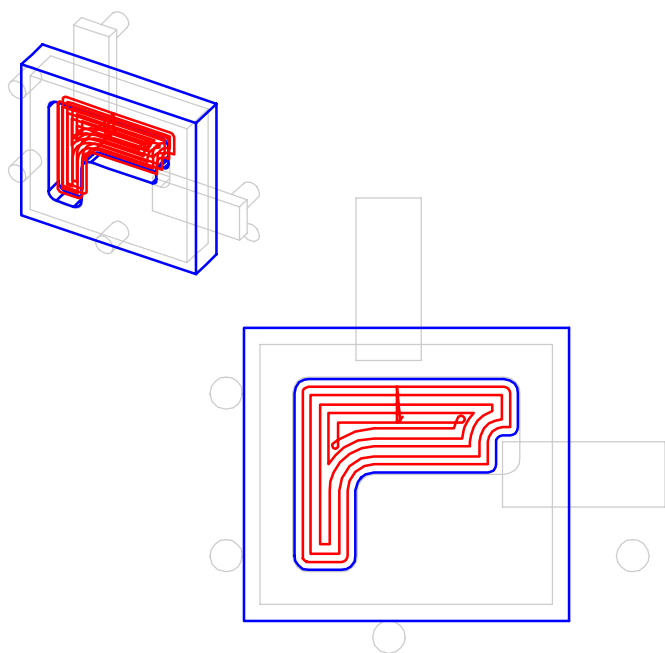🚫 Don't close the Operation Specification form.

What: Generate the toolpath.

How:

Operation Specification form

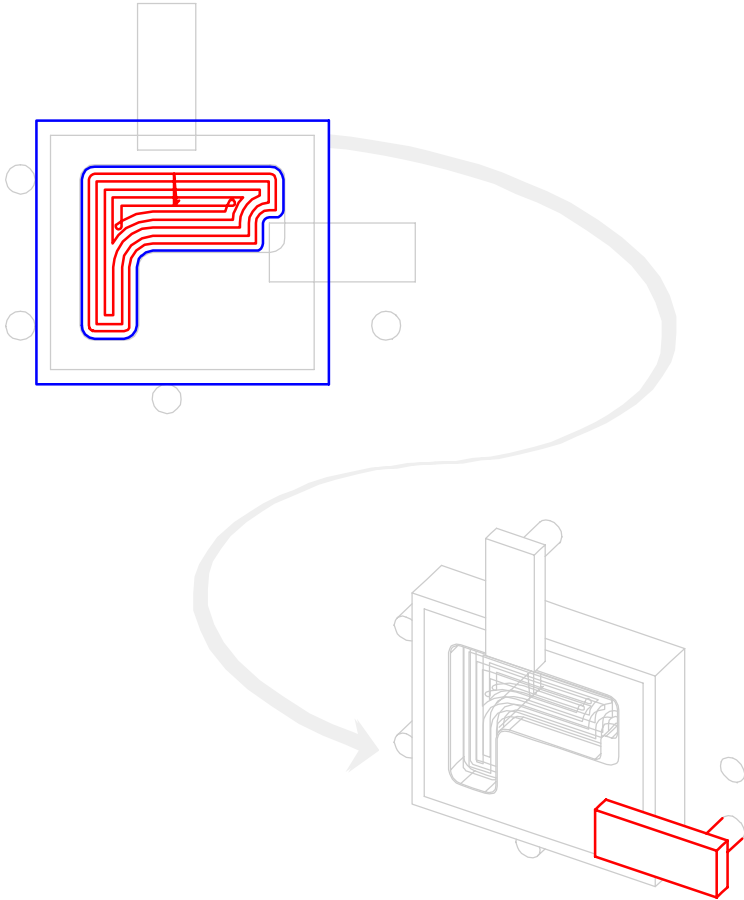
Recovery Point

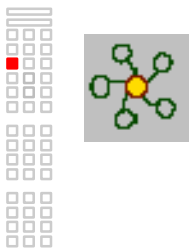 *File*
          Save

Things to notice

The in-process stock reflects the volume of material removed by the tool. Material is even left where the tool overlaps the pocket. The tool follows in a spiral-out cut pattern to machine the selected surfaces.

In the next steps, you'll modify the setup assembly by moving the clamp that blocks the pocket. You'll do this by deleting the existing centerline–to–centerline constraint and then creating a new centerline–to–centerline constraint. You do not want to delete the face–to–face constraint.
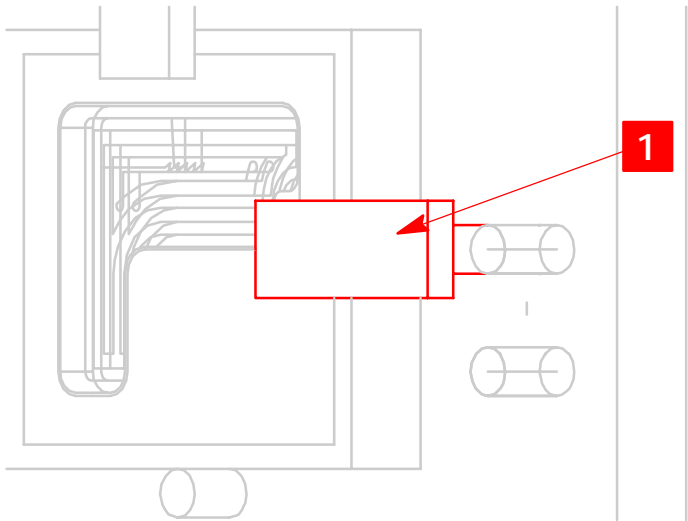
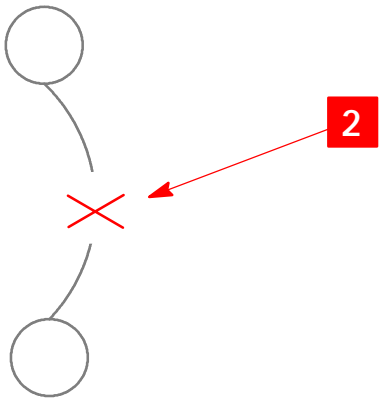**What:** Delete the centerline–to–centerline constraint.

How:

1 Pick anywhere on the clamp.

Don't close the Assembly Relations Browser form.

Assembly Relations Browser form
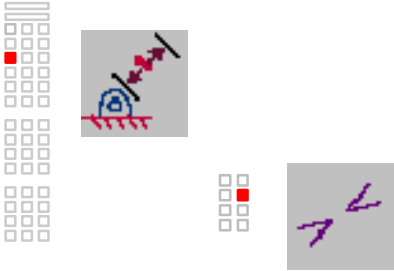

2 Centerline constraint

I–DEAS Warning

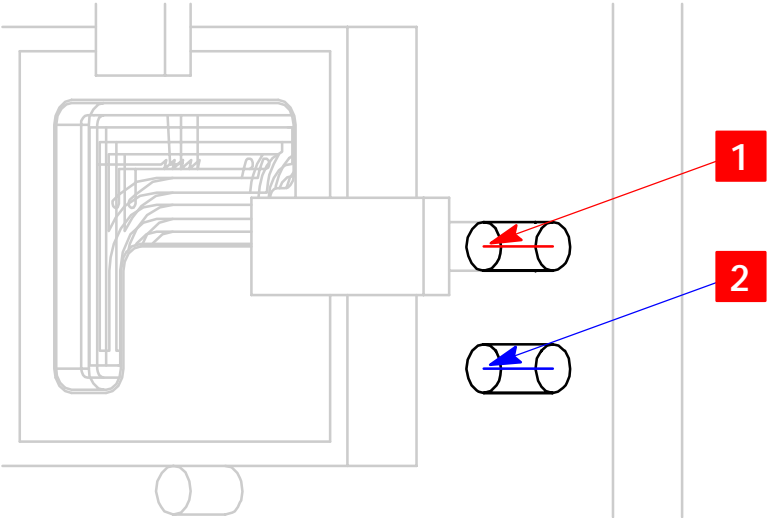▭ *OK*

▭ *Dismiss*

Recovery Point

File
  Save

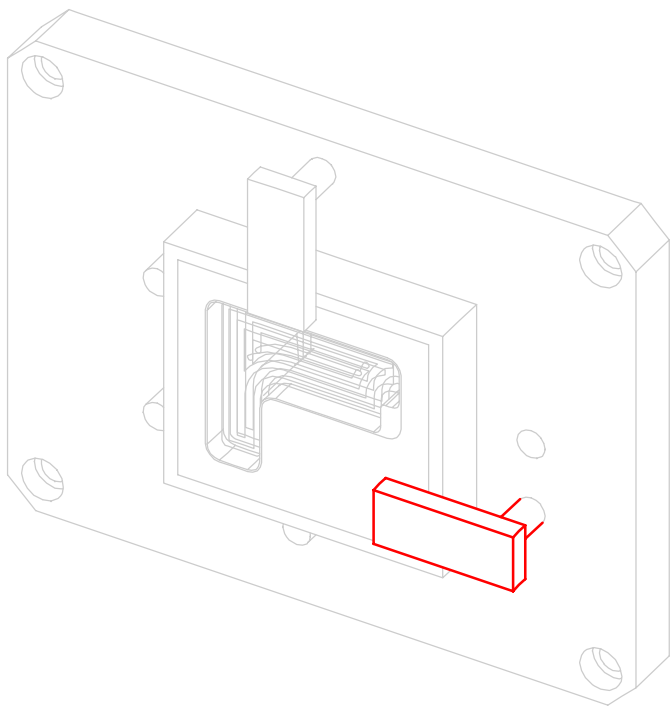**What:** Move the clamp by creating a new centerline–to–centerline constraint.

How:

1 CL1 (centerline of clamp)

2 CL13 (centerline of hole)

Result

Things to notice
The clamp is positioned in the second hole and no longer obscures the pocket.

Recovery Point

 File
 Save

When you modify a job after generating a toolpath, the software warns you about the effects of those changes with a validity flag:

- +, or valid—the job entity is up–to–date and doesn't require changes
- –, or invalid—the job entity may transfer out-of-date information to the CL file, or the CL file itself is out-of-date
- o, or user validated—an invalid operation has been accepted and doesn't require further modification

If you recall, you just modified the setup assembly by moving a clamp. In the next steps, you'll review the validity flags and reprocess the toolpath to make the operation valid.
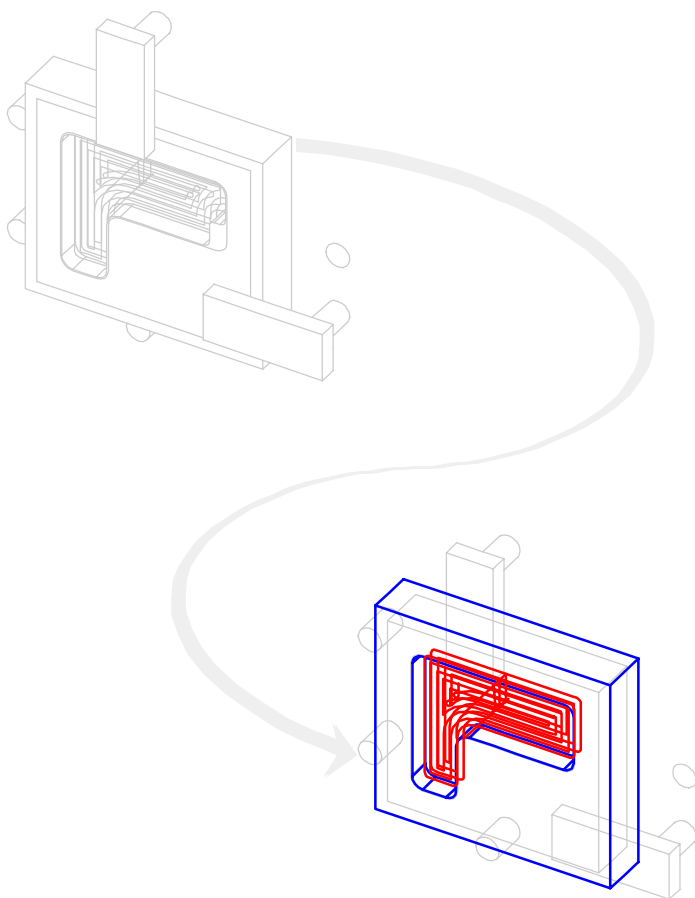
What: Check the validity flags to determine the effects of your changes to the setup assembly.

How:
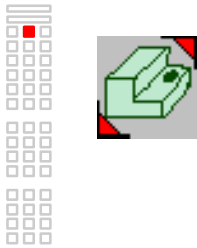
NC Job Planning form

 Clear Pocket

Things to notice

The "–" next to the operation indicates it may be invalid. An operation can become invalid if you change the selected surfaces, the machining parameters, the cutting tool, or the setup. An operation is also marked invalid if you haven't created a toolpath for it yet.
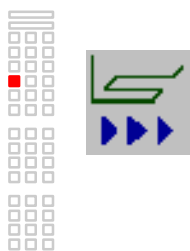

 Check *I-DEAS List*.

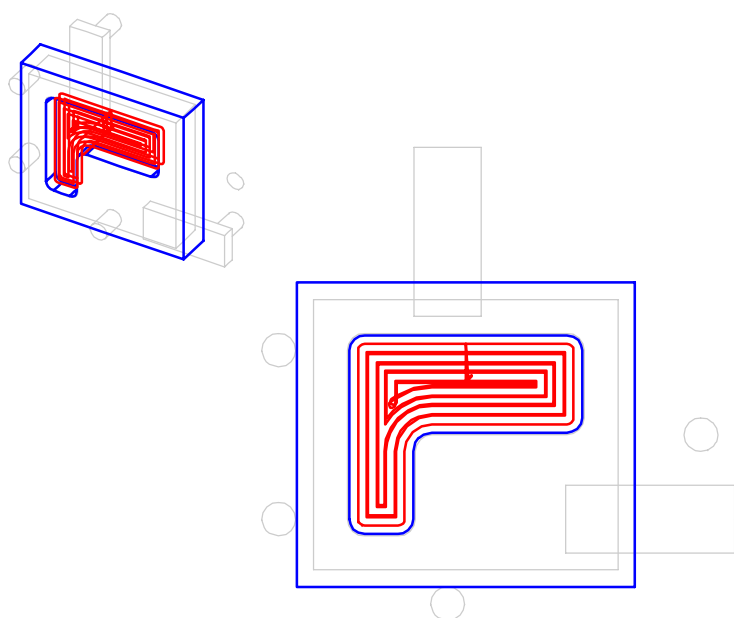The I-DEAS List suggests reprocessing the toolpath to update the operation.

 Dismiss

What: Reprocess the toolpath.

How:

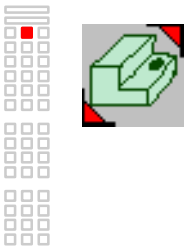## I–DEAS Warning form

 OK

Things to notice
The tool cleans up the material that was once covered by the clamp.

What: Review the validity flags.
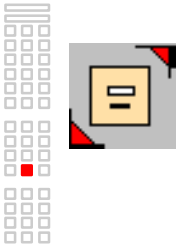
How:

NC Job Planning form

Things to notice

The "+" validity marker by the operation indicates the toolpath has been updated.

 Dismiss

What: Look at the assemblies and parts in the bins.

How:

Manage Bins form

Things to notice
The software creates a new bin called In-Process Stock to contain the in-process stock models after each toolpath. For this operation, you created an in-process stock model called Stock-ips1 (double–click *Setup Tutorial Job...)*. The software saves each stock model so it can be used for the following cutting operation.

 Dismiss

Tutorial wrap-up

You've completed the Generating In-process Stock and Checking Validity tutorial.